

Soy peptide + chemo drug block colon cancer's spread to liver

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A University of Illinois study reports a promising new weapon in treating metastatic colon cancer, particularly in patients who have developed resistance to chemotherapy.

U of I researcher Elvira de Mejia has found that the soy peptide lunasin binds to a specific receptor in highly metastatic [colon cancer cells](#), preventing them from attaching to the liver.

"When lunasin was used in combination with the [chemotherapy](#) drug oxaliplatin, we saw a sixfold reduction in the number of new tumor sites," said de Mejia, a U of I associate professor of [food chemistry](#) and food toxicology.

The study appears in the most recent issue of [Cancer Letters](#) and can be accessed online at

<http://www.sciencedirect.com/science/article/pii/S0304383511005325> .

In a separate study, the scientists showed that lunasin induces [cell death](#) in highly metastatic human [colon cancer](#) cells.

According to de Mejia, almost all colon cancer deaths are caused when cancer metastasizes—or spreads—to the liver. Until now chemotherapy has targeted the primary tumor because the process of metastasis is not well understood, she said.

"In this study, we have learned that lunasin can penetrate the cancer cell, cause cell death, and interact with at least one type of receptor in a cell

that is ready to metastasize," said Vermont P. Dia, a U of I postdoctoral fellow in the de Mejia laboratory and lead author of the study.

When that receptor is blocked, new blood vessels can't form and differentiate, and that prevents cancer from spreading. Binding such receptors has emerged as a promising target for developing cancer therapies, he said.

In the study, which mimicked the spread of colon cancer in humans, mice were separated into four groups: a control group; a group that was injected daily with lunasin; a group injected with the chemo drug oxaliplatin; and a group that received both lunasin and [oxaliplatin](#). After 28 days, the mice were examined to learn the extent of cancer's involvement in the [liver](#).

"The group that received lunasin alone had 50 percent fewer metastatic sites. But an even more exciting result was seen in the group that received both lunasin and the chemotherapy drug—only 5 new cancer sites when compared with 28 in the control group," de Mejia noted.

"This huge reduction in metastasis was achieved with the amount of lunasin in only 25 daily grams of soy protein, the amount recommended in the FDA health claim," Dia said.

The researchers said they recently analyzed commercial soy milks available in their area, and all contained lunasin. However, the amount of lunasin depended on the type of soy product that was used to prepare the soy milk.

"Two glasses of soy milk a day generally provide half the amount of lunasin used in our study," said de Mejia. "It certainly seems feasible to create a lunasin-enriched product that people could consume in a preventive way."

The scientists said their next step will be a colon cancer study in which they make lunasin part of the animals' diet—rather than injecting the peptide—to see if digestion and absorption alter its effectiveness. Soon they hope to be able to move on to human trials.

Dia received the American Oil Chemists Society's 2011 Hans Kaunitz Award for his work with lunasin.

More information: Vermont P. Dia and Elvira de Mejia of the U of I are co-authors of both the study published in *Cancer Letters* and the in vitro study of lunasin's effect on human cancer cells published in *Molecular Nutrition & Food Research*, vol. 55, p. 623-634, 2011, available online at [www://onlinelibrary.wiley.com/doi/10.1002/mnfr.201000419/pdf](http://onlinelibrary.wiley.com/doi/10.1002/mnfr.201000419/pdf)

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